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Applied Intelligence and Informatics


First International Conference, AII 2021
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Proceedings


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Preface

The term ‘Intelligence’ is defined as the ability to perceive or infer information, and to retain it as knowledge to be applied towards adaptive behaviours within an environment or context. It can be the capacity for logic, understanding, self-awareness, learning, emotional knowledge, reasoning, planning, creativity, critical thinking, and problem-solving. ‘Informatics,’ on the other hand, is the study of the structure, behavior, and interactions of natural and engineered computational systems. It studies the representation, processing, and communication of information in natural and engineered systems. Applying both intelligence and informatics can be used to solve the most complex problems in science, engineering, real-life manufacturing, defence, management, government, and industrial domains.

The 2021 International Conference on Applied Intelligence and Informatics (AII 2021) brought together researchers and practitioners from diverse domains to share cutting-edge research results obtained through the application of intelligence and/or informatics to solve problems that it otherwise would not have been possible to solve. AII 2021 also fostered the exchange and dissemination of innovative and methodologies and the practical development of technologies with real-life applications.

The concept of the AII conference series was conceived last year when the whole world was combating the first wave of COVID-19. During that extremely challenging time, everyone, especially scientists and researchers from all disciplines, wanted to contribute in their own ways to this war against COVID-19. When cities and countries were going into lockdown, and universities and research labs were evacuated to stop the aggressive spread of the disease, computational scientists and researchers contributed significantly through developing different methods to detect and diagnose the disease, building models to help stop its spread, and facilitating the development of vaccines. However, most of these methods which were developed and published to fight the pandemic remained proprietary and had limited access for others to reproduce the results. Realising this, a set of committed academics felt the need for a dedicated avenue to discuss the reproducibility of research results through sharing the methods and the datasets. The AII conference series was born with a keen focus on the applications of Artificial Intelligence and Informatics, not only in the field of healthcare but also in all walks of life.

This first edition of AII was supposed to be held in Nottingham, UK; however, this was not possible due to the extenuating circumstances caused by COVID-19. This led to the organisation of the event in a fully virtual mode, with the hope that future editions will be held physically. The AII 2021 online conference was supported by the Applied Intelligence and Informatics (AII) Laboratory, the Web Intelligence Consortium (WIC), Nottingham Trent University, the IEEE Computational Intelligence Society UK and Ireland Chapter, and the International Academic Communication Center (IRNet).

The theme of AII 2021 was “Fostering the Reproducibility of Scientific Results.” The goal was to see how best we can promote open methodological contributions to reproduce the scientific results presented in the literature. The papers presented at AII 2021 addressed broad perspectives on applied research to facilitate the reproduction of results. These papers provide a good sample of state-of-the-art research advances on applications of artificial intelligence and informatics in diverse fields and disciplines. The selected papers cover five major tracks: (1) Application of AI in Disease Detection, (2) Application of AI in Healthcare, (3) Application of AI in Pattern Recognition, (4) Application of AI in Network, Security, and Analytics, and (5) Emerging Applications of AI and Informatics.

This first edition of the AII conference attracted 107 submissions from authors in 16 countries across all five AII 2021 tracks. The submitted papers underwent a single blind review process, soliciting opinion from at least three experts: a minimum of two independent reviewers and the handling chair. After the rigorous review process, reports from the reviewers and the track chairs on the respective papers were considered and, finally, 30 full papers from authors in 12 countries were accepted for presentation at the conference. Therefore, this volume of the conference proceedings contains those 30 papers which were presented virtually at AII 2021. Despite the COVID-19 pandemic situation, it was an amazing response from the community during this challenging time.

We would like to express our gratitude to all AII 2021 conference committee members for their instrumental and unwavering support. AII 2021 had a very exciting program which would not have been possible without the generous dedication of the Program Committee members in reviewing the conference papers. AII 2021 could not have taken place without great team effort and generous support from our sponsors.

We would especially like to express our sincere appreciation to our kind sponsors, including Springer Nature and the Springer CCIS team. Our gratitude goes to the AII Lab for sponsoring 25 author registrations, which were selected based on the quality of the submitted papers and their need for financial support.

We are grateful to Ronan Nugent, Amin Mobasher, Alla Freund, Samuel Raj, Selma Somogy, Guido Zosimo-Landolfo, and the complete Springer CCIS team for their continuous support in coordinating the publication of this volume.

Last but not least, we thank all our contributors and volunteers for their support during this challenging time to make AII 2021 a success.

July 2021

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Contents

Application of AI and Informatics in Disease Detection

Inference and Learning Methodology of Belief Rule Based Expert System to Assess Chikungunya	3
<i>Zinnia Sultana, Lutfun Nahar, Nanziba Basnin, and Mohammad Shahadat Hossain</i>	
Glaucoma Detection Using Inception Convolutional Neural Network V3	17
<i>Tasnim Afroze, Shumia Akther, Mohammed Armanuzzaman Chowdhury, Emam Hossain, Mohammad Shahadat Hossain, and Karl Andersson</i>	
iConDet: An Intelligent Portable Healthcare App for the Detection of Conjunctivitis	29
<i>Prateeti Mukherjee, Ishita Bhattacharyya, Meghma Mullick, Rahul Kumar, Nilanjana Dutta Roy, and Mufti Mahmud</i>	
Selecting Lung Cancer Patients from UK Primary Care Data: A Longitudinal Study of Feature Trends	43
<i>Abeer Alzubaidi, Jaspreet Kaur, Mufti Mahmud, David J. Brown, Jun He, Graham Ball, David R. Baldwin, Emma O'Dowd, and Richard B. Hubbard</i>	
Extending Upon a Transfer Learning Approach for Brain Tumour Segmentation	60
<i>Jiachenn Choong and Nazia Hameed</i>	
Automatic Seizure Prediction Based on Cross-Feature Fusion Stream Convolutional Neural Network	70
<i>Yue Wang, Yu Wang, and Yan Piao</i>	

Application of AI and Informatics in Healthcare

Anomaly Detection in Invasively Recorded Neuronal Signals Using Deep Neural Network: Effect of Sampling Frequency	79
<i>Marcos Fabietti, Mufti Mahmud, and Ahmad Lotfi</i>	
Classification of First Trimester Ultrasound Images Using Deep Convolutional Neural Network	92
<i>Rishi Singh, Mufti Mahmud, and Luis Yovera</i>	

Method to Enhance Classification of Skin Cancer Using Back Propagated Artificial Neural Network.	106
<i>V. Nyemeeesha and B. Mohammed Ismail</i>	
Knowledge Discovery from Tumor Volume Using Adaptive Neuro Fuzzy Inference System Rules	123
<i>V. V. Gomathi, S. Karthikeyan, and R. Madhu Sairam</i>	
Key Techniques and Challenges for Processing of Heart Sound Signals.	136
<i>Sheikh Hussain Shaikh Salleh, Fuad M. Noman, Ting Chee-Ming, Syed Rasul Bin G. Syed Hamid, Siti Hadrina Bt Sheikh Hussain, M. A. Jalil, A. L. Ahmad Zubaidi, Kavikumar Jacob, Kanad Ray, M. Shamim Kaiser, and Jalil Ali</i>	
Enhanced Signal Processing Using Modified Cyclic Shift Tree Denoising . . .	150
<i>Hadri Hussain, W. S. N. A. Wan Abd Aziz, Ting Chee-Ming, Fuad M. Noman, A. L. Ahmad Zubaidi, S. B. Samdin, Hadrina Sh, M. A. Jalil, Yusmeera Yusoff, Kavikumar Jacob, Kanad Ray, M. Shamim Kaiser, Sheikh Hussain Shaikh Salleh, and Jalil Ali</i>	
Application of AI and Informatics in Pattern Recognition	
A Machine Learning Driven Android Based Mobile Application for Flower Identification	163
<i>Towhidul Islam, Nurul Absar, Abzetdin Z. Adamov, and Mayeen Uddin Khandaker</i>	
A Generative Text Summarization Model Based on Document Structure Neural Network	176
<i>Haihui Huang and Maohong Zha</i>	
Human Gender Detection from Facial Images Using Convolution Neural Network	188
<i>Tahmina Akter Sumi, Mohammad Shahadat Hossain, Raihan Ul Islam, and Karl Andersson</i>	
Few-Shot Learning for Tamil Handwritten Character Recognition Using Deep Siamese Convolutional Neural Network.	204
<i>Noushath Shaffi and Faizal Hajamohideen</i>	
A CNN Based Model for Venomous and Non-venomous Snake Classification	216
<i>Nagifa Ilma Progga, Noortaz Rezoana, Mohammad Shahadat Hossain, Raihan Ul Islam, and Karl Andersson</i>	

Recognition of Dysfluency in Speech: A Bidirectional Long-Short Term Memory Based Approach	232
<i>N. A. Vinay, S. H. Bharathi, and V. N. Manjunath Aradhya</i>	

Application of AI and Informatics in Network, Security, and Analytics

Distributed Denial of Service Attack Detection Using Machine Learning and Class Oversampling	247
<i>Sakib Shahriar Shafin, Sakir Adnan Prottoy, Saif Abbas, Safayat Bin Hakim, Abdullahi Chowdhury, and Md. Mamunur Rashid</i>	

Scientific Metrological Analysis of Government Services Based on Big Data Analysis and Visualization Software Driven by Information Technology	260
<i>Wei-Keng Zhou, Yan-Tong Lin, Zhi-Xiang Zhou, Xin Bai, Yi-Lin Yu, and Yu-Wen Pan</i>	

Violent Video Event Detection: A Local Optimal Oriented Pattern Based Approach	268
<i>B. H Lohithashva and V. N Manjunath Aradhya</i>	

Human Age Estimation Using Deep Learning from Gait Data.	281
<i>Refat Khan Pathan, Mohammad Amaz Uddin, Nazmun Nahar, Ferdous Ara, Mohammad Shahadat Hossain, and Karl Andersson</i>	

An Error Resilient Video Transmission in Ad Hoc Network Using Error Diffusion Block Truncation Coding	295
<i>S. Sasi Kumar, K. Siva Kumar, M. A. Jalil, J. Kavikumar, K. Ray, and D. Nagarajan</i>	

ALO: AI for Least Observed People	306
<i>Shamim Al Mamun, Mohammad Eusuf Daud, Mufti Mahmud, M. Shamim Kaiser, and Andre Luis Debiaso Rossi</i>	

Emerging Applications of AI and Informatics

COVID-Hero: Machine Learning Based COVID-19 Awareness Enhancement Mobile Game for Children	321
<i>Md. Shahriare Satu, K. Shayekh Ebne Mizan, Syeda Anika Jerin, Md Whaiduzzaman, Alistair Barros, Kawsar Ahmed, and Mohammad Ali Moni</i>	

Literature Classification Model of Deep Learning Based on BERT-BiLSTM—Taking COVID-19 as an Example	336
<i>Zhi Li</i>	

Identifying Relevant Stakeholders in Digital Healthcare	349
<i>Nasrin Sultana Nipa, Mehnaz Alam, and Md Sanaul Haque</i>	
COVID-19 Detection Using Chest X-Ray Images with a RegNet Structured Deep Learning Model	358
<i>Md. Kawsher Mahbub, Milon Biswas, Abdul Mozid Miah, Ahmed Shahabaz, and M. Shamim Kaiser</i>	
Mixed Bangla-English Spoken Digit Classification Using Convolutional Neural Network	371
<i>Shuvro Das, Mst. Rubayat Yasmin, Musfikul Arefin, Kazi Abu Taher, Md Nasir Uddin, and Muhammad Arifur Rahman</i>	
Sluggish State-Based Neural Networks Provide State-of-the-art Forecasts of Covid-19 Cases.	384
<i>Oluwatamilore Orojo, Jonathan Tepper, T. M. McGinnity, and Mufti Mahmud</i>	
Correction to: Mixed Bangla-English Spoken Digit Classification Using Convolutional Neural Network	C1
<i>Shuvro Das, Mst. Rubayat Yasmin, Musfikul Arefin, Kazi Abu Taher, Md Nasir Uddin, and Muhammad Arifur Rahman</i>	
Author Index	401